77TH CONGRESS, 1st Session | HOUSE OF REPRESENTATIVES | DOCUMENT No. 322

ST. JOHNS RIVER, FLA., JACKSONVILLE TO THE OCEAN

LETTER

FROM

THE SECRETARY OF WAR

TRANSMITTING

A LETTER FROM THE CHIEF OF ENGINEERS, UNITED STATES ARMY, DATED APRIL 25, 1941, SUBMITTING A REPORT, TOGETHER WITH ACCOMPANYING PAPERS AND ILLUSTRATIONS, ON REEXAMINATION OF ST. JOHNS RIVER, FLA., FROM JACKSONVILLE TO THE OCEAN, AND ST. JOHNS RIVER, FLA., IN THE VICINITY OF DAMES POINT AND NEW BERLIN, REQUESTED BY RESOLUTIONS OF THE COMMITTEE ON RIVERS AND HARBORS, HOUSE OF REPRESENTATIVES, ADOPTED JUNE 9, 1937, AND MARCH 16, 1939

JULY 23, 1941.—Referred to the Committee on Rivers and Harbors and ordered to be printed with three illustrations

WAR DEPARTMENT,
Washington, July 18, 1941.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated April 25, 1941, from the Chief of Engineers, United States Army, on reexamination of St. Johns River, Fla., from Jacksonville to the ocean, and St. Johns River, Fla., in the vicinity of Dames Point and New Berlin, requested by resolutions of the Committee on Rivers and Harbors, House of Representatives, adopted June 9, 1937, and March 16, 1939, together with accompanying papers and illustrations.

The Bureau of the Budget has been consulted and advises that there would be no objection to the submission of the proposed report to the committee, with the understanding that any early provision of funds for the project would be only for such parts of the project as would contribute directly to the national defense.

Sincerely yours,

HENRY L. STIMSON,
Secretary of War.

61034—41——1

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 25, 1941.

The CHAIRMAN, COMMITTEE ON RIVERS AND HARBORS,
House of Representatives, Washington, D. C.

MY DEAR MR. CHAIRMAN: 1. The Committee on Rivers and Harbors of the House of Representatives, by resolution adopted June 9, 1937, requested the Board of Engineers for Rivers and Harbors to review the reports on St. Johns River, Fla., from Jacksonville to the ocean, submitted in House Document No. 483, Seventieth Congress, second session, and subsequent reports, with a view to determining if further improvement is advisable at the present time; and under date of March 16, 1939, requested the Board of Engineers for Rivers and Harbors to review the reports on St. Johns River, Fla., submitted April 1, 1937, and previous reports, with a view to determining if it is advisable to make any change in the recommendations heretofore made in regard to the area in the vicinity of Dames Point and New Berlin. I enclose the report of the Board in response thereto.

2. After full consideration of the report secured from the division engineer, and after affording local interests full opportunity to be heard, the Board recommends modification of the existing project for St. Johns River, Jacksonville to the ocean, to provide for maintenance of channel widths as they now exist, as indicated in table 5 in the report of the division engineer, and, subject to the revision of harbor lines proposed by the division engineer, for further improvement as follows: (*a*) Widen Terminal Channel between its present westerly edge and the new pierhead-bulkhead line to a depth of 30 feet; (*b*) dredge to a depth of 28 feet the area between the foot of Laura Street and the Duval County Highway Bridge; (*c*) dredge a navigation and floodway channel 200 feet wide and 26 feet deep, along the south side of the Commodore Point Terminals, terminating in deep water at each end; and (*d*) dredge an approach and mooring basin 20 feet deep, 1,300 feet long at the 20-foot depth contour and 600 feet long at the pierhead line in front of the Naval Reserve Armory in South Jacksonville; all substantially in accordance with the plan contained in the report of the division engineer, at an estimated first cost of $725,000, with $8,000 annually for maintenance, in addition to the amount now required; subject to the provisions that no dredging be done within 60 feet of a pierhead line, except at the Naval Armory, and that local interests furnish, free of cost to the United States, all lands, easements, and rights-of-way and spoil disposal areas for the initial work and for subsequent maintenance when and as required, and hold and save the United States free from claims for damages resulting from the improvement.

3. The Acting Secretary of the Navy, in a letter dated February 27, 1941, recommends that this project be considered essential in the interest of national defense.

4. After full consideration of the reports and of the statement of the Acting Secretary of the Navy, I recommend modification of the existing project in accordance with the recommendation of the Board of Engineers for Rivers and Harbors; except that the requirements of local cooperation as to items (*b*) and (*d*) may be waived or modified if

in the discretion of the Chief of Engineers such action is necessary in the interest of national defense.

Very truly yours,

J. L. SCHLEY,
Major General,
Chief of Engineers.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, March 3, 1941.

Subject: St. Johns River, Jacksonville to the ocean.
To: The Chief of Engineers, United States Army.

1. This report is in response to the following resolutions, adopted June 9, 1937, and March 16, 1939, respectively:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on St. Johns River, Fla., from Jacksonville to the ocean, submitted in House Document No. 483, Seventieth Congress, second session, and subsequent reports, with a view to determining if further improvement is advisable at the present time.

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on St. Johns River, Fla., submitted April 1, 1937, and previous reports, with a view to determining if it is advisable to make any change in the recommendations heretofore made in regard to the area in the vicinity of Dames Point and New Berlin.

2. The St. Johns River rises in east-central Florida, flows generally north parallel to the east coast for 257 miles to Jacksonville and then generally east 28 miles to the Atlantic Ocean. From the mouth to Jacksonville the river varies in width from 1,200 to 11,000 feet, averaging 5,000 feet wide opposite the Jacksonville water front. Some 5 miles of this reach has natural depths of 30 feet or over and the intervening shoal areas have been dredged to provide a continuous depth of 30 feet or more. The existing ship channel follows the natural course of the river and is characterized by a number of bends, particularly between Eastport and Browns Creek and between Dames Point and Fulton. The project authorized by Congress provides for a channel 30 feet deep from the ocean to Jacksonville, 600 feet wide through the entrance and 300 feet wide in the straight reaches of the river and of greater width at the bends and in certain cuts, and for jetties at the entrance to the river and stone training walls and shore protective works in the river. A width of 1,200 feet is provided at Dames Point and 600 feet or more at other bends. The project also provides for an anchorage basin opposite Mayport (mile 3¾); for a channel 24 feet deep at Jacksonville between the 24-foot contour and the pierhead line from the Florida East Coast Railway bridge downstream to Hogan Creek, a distance of 6,080 feet; and for a channel 400 feet wide and 30 feet deep along the terminals on the west bank of the river between Commodore Point and deep water just above Six Mile Creek cut. The project is subject to such

modifications in detail as the Chief of Engineers may deem advisable. The project has been completed, at a total cost to June 30, 1940, of $17,960,000, of which $8,780,000 was for new work and $9,180,000 was for maintenance since 1907. The latest approved estimate for annual cost of maintenance is $456,500. Except in Arlington cut, which is only 300 feet wide, and in White Shells Bend, which is 475 feet, the actual width is everywhere at least 400 feet in reaches and 650 feet in bends. No local cooperation has been required, but Duval County has expended $303,206 for channel improvements in the lower river between 1892 and 1894, and local interests are reported to have spent over $360,000 between 1904 and 1930 in maintaining a channel along the Jacksonville water front between Commodore Point and Six Mile Creek. It is also reported that private interests expend approximately $47,500 annually in dredging and maintaining approach channels to their terminals. Dames Point is on the north bank 14 miles below Jacksonville, where the river changes direction abruptly from southeast to northeast; and the small village of New Berlin is on the north bank 1 mile below Dames Point. The ship channel in the straight reach opposite New Berlin is 600 to 1,000 feet wide and lies 125 to 600 feet offshore. To assist in its maintenance, training dikes originally constructed by local interests between three islands in the vicinity have been raised, extended, and partially realined to form a continuous bank 6 miles in length on the south side of the channel, lying 900 to 1,800 feet offshore. This work was completed in 1904. In 1909, to stop erosion of the shore and consequent deterioration of the channel, the United States constructed a stone and brush mattress revetment 550 feet long at New Berlin, at a cost of approximately $10,000. This structure remains in good condition, but various timber bulkheads provided by local property owners have been undermined and washed out. The mean range of tide at Dames Point is 2.2 feet.

3. Jacksonville Harbor, the principal port in Florida, serves the northern part of Florida and the southern portion of Georgia, and in respect to certain commodities, the entire Florida Peninsula. The principal terminal developments are on the north side of the river between the Florida East Coast Railway bridge and Commodore Point, mile 25.5, and the west side of the river between Commodore Point and Six Mile Creek, mile 21. The port is served by five railroads and an adequate system of improved highways. The Intracoastal Waterway crosses the St. Johns River near its mouth. During the past decade the commerce of the port has varied between 2,000,000 and 3,500,000 tons annually. For 1939 it amounted to 3,313,000 tons and consisted principally of petroleum products, citrus fruits, winter vegetables, forest products, fertilizer, and steel scrap. For 1939 the number of round trips of oceangoing vessels is reported as 1,800, on drafts up to 29½ feet. In addition, a large number of small craft plied the harbor and there were 53 round trips of Coast Guard and naval vessels. Of a total of 173 dockings of vessels drawing 24 feet or more only 10 were at terminals above Commodore Point.

4. Local interests request widening along the west side of Terminal Channel and along the north side of the channel west of Commodore Point to provide more ready access to wharves and piers, to reduce the cost to terminal operators for maintenance of approaches to wharves, and to increase the facility and safety of navigation of large

vessels calling at the port. They also request deepening of the area outside the pierhead line between the highway bridge and Laura Street to permit large cargo and passenger vessels to reach the piers safely at any stage of the tide. Representatives of the local division of the United States Naval Reserve request that a depth of 20 feet be provided in front of the Naval Armory to permit vessels to reach the wharf and to provide an anchorage area for naval and Coast Guard vessels which now must depend upon the gratuitous use of commercial wharves or anchor in the stream. Owners of residential property at Dames Point and New Berlin request protection of their property against erosion which they believe has been caused by the navigation improvement which has made possible the use of larger vessels, greater speeds, and consequently greater wave wash.

5. The division engineer reports that safety and convenience of present commerce and navigation require expansion of facilities of the port which can best be obtained by certain revisions of harbor lines and by widening Terminal Channel westward 190 feet, continuing the widening downstream to Long Branch; by deepening to 26 feet a channel 200 feet wide through the shoal south and west of Commodore Point; by deepening to 28 feet the area riverward of the new harbor line between Laura Street and the highway bridge; and by adopting as project widths the widths now existing and maintained in the several reaches and bends between Jacksonville and the ocean. To permit approach to the Naval Reserve Armory by naval and Coast Guard vessels, he believes that a mooring basin 20 feet deep should be provided on the south side of the channel opposite the armory. He notes that the cost of dredging from the channel the material eroded from Dames Point is less than the cost of preventing the erosion and concludes that protection of the point is not warranted in the interest of navigation. The aggregate cost of the proposed improvement is $715,000 and the estimated increase in annual cost of maintenance is $8,000. The estimated Federal annual charge is $39,200. The division engineer notes that the value of the desired basin at the naval armory pier cannot be expressed in terms of money savings, but that absence of suitable space for mooring naval vessels imposes inconveniences, uncertainty, and some cost on the vessels. Annual savings to commerce from reduced dredging in entrance to slips, from reduction in damages to shipping, and from elimination of certain operating charges now necessitated by reason of inadequate channels are estimated at $62,000. The division engineer recommends the improvements and the modification of the existing project to authorize maintenance of the channel at the existing widths in reaches and bends.

6. As a condition to improvement at Federal expense, the division engineer recommends that local interests furnish convenient spoil areas for material removed in original dredging and subsequent maintenance of the entire project when and as required, and when it is impracticable to provide acceptable spoil areas at such distance from the work that a pipe line not over 5,000 feet long can be used, pay the excess cost of dredging due to the use of a longer pipe line or other means of disposal of the dredged material; and that local interests release the United States from damages to wharves, bulkheads, and other structures during dredging operations.

7. Local interests were informed of the conclusions of the division engineer. At their request a public hearing was held before the Board of Engineers for Rivers and Harbors, at which they urged the revetment of the banks at Dames Point and at New Berlin to prevent continued erosion and eventual total loss of valuable residential property. The Board made an inspection of the harbor at Jacksonville and of the banks of the river at Dames Point and New Berlin. Subsequently, representatives of local interests submitted a brief in support of their contention that increased channel widths are necessary and justified by the increasing commerce. In an official communication dated February 1, 1941, from the Acting Secretary of the Navy to the Secretary of War the Navy Department recommends the proposed dredging of the basin between Laura Street and the highway bridge in that it will facilitate the operation of Naval vessels through the draw span and will be a step toward the ultimate development of a deeper channel to the naval air station. It also recommends favorable consideration of the dredging of the basin at the Naval Reserve pier and asks that the Federal project include necessary dredging to the face of the bulkhead.

8. A statement submitted to the Board in behalf of the Association of American Railroads noted exception to the requirement that local interests pay the excess cost of dredging that would be occasioned by the use of a pipe line longer than 5,000 feet, or by other means of disposal.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

9. The Board concurs generally in the conclusions and recommendations of the division engineer. A large and steadily increasing volume of commerce is taxing the capacity of present facilities at Jacksonville. Provision for increasing these facilities must soon be made. The plan of improvement proposed by the division engineer will at reasonable cost provide access to berthing areas sufficient for accommodation of the commerce that may be expected to develop over a good many years. It will provide properly for naval and Coast Guard vessels that visit the port in large numbers and will contribute greatly to the safety and convenience of established navigation. In view of the request of the Navy Department the Board is of the opinion that dredging of the area immediately in front of the bulkhead of the Naval Reserve Armory, which work normally is the responsibility of local interests, should in this case be included as a part of the Federal project. The increased cost is estimated at $6,000. In the opinion of the Board no practical purpose will be served by making the accomplishment of an economically sound navigation project conditional upon the distance to spoil areas furnished by local interests or disposal of dredged material by any method other than usual dredging operations. The Board is not convinced that the erosion at Dames Point has resulted largely from Federal navigation improvements or that the construction of protective works is either a legal or a moral obligation of the United States. The property involved is at a bend in the main channel, and most of it fronts the river on a comparatively high sandy bluff. It is a universal fact in rivers that such property will erode under the action of natural forces in the absence of any

modifying influence of man and the existence of such bluffs is prima facie evidence thereof. Waves and tidal currents are the principal causes of such erosion, which would probably have progressed even had the United States undertaken no improvement of the locality. The amount of the erosion is not great and even should the entire yardage find its way eventually into the dredged channel, the cost of its removal would be far less than that of suitable protective works.

10. The Board recommends modification of the existing project for St. Johns River, Jacksonville to the ocean, to provide for maintenance of channel widths as they now exist, as indicated in table 5 in the report of the division engineer and, subject to the revision of harbor lines proposed by the division engineer, for further improvement as follows: (*a*) Widen Terminal Channel between its present westerly edge and the new pierhead-bulkhead line to a depth of 30 feet; (*b*) dredge to a depth of 28 feet the area between the foot of Laura Street and the Duval County highway bridge; (*c*) dredge a navigation and floodway channel 200 feet wide and 26 feet deep, along the south side of the Commodore Point Terminals, terminating in deep water at each end; and (*d*) dredge an approach and mooring basin 20 feet deep, 1,300 feet long at the 20-foot depth contour and 600 feet long at the pierhead line in front of the Naval Reserve Armory in South Jacksonville; all substantially in accordance with the plan contained in the report of the division engineer, at an estimated first cost of $725,000, with $8,000 annually for maintenance, in addition to the amount now required; subject to the provisions that no dredging be done within 60 feet of a pierhead line, except at the Naval Armory, and that local interests furnish, free of cost to the United States, all lands, easements, and rights-of-way, and spoil-disposal areas for the initial work and for subsequent maintenance when and as required, and hold and save the United States free from claims for damages resulting from the improvement.

For the Board:

THOMAS M. ROBINS,
Brigadier General,
Corps of Engineers,
Senior Member.

REEXAMINATION OF ST. JOHNS RIVER, FLA., JACKSONVILLE TO THE OCEAN

SYLLABUS

Local interests desire that the 30-foot Terminal Channel in St. Johns River, Jacksonville to the ocean, be widened 200 feet along its westerly side; that the shoal between Commodore Point and the Bull Line terminal be removed to a depth of 30 feet up to a revised pierhead line which they propose to locate about 100 feet riverward of the present bulkhead; that the existing 24-foot basin between Laura Street and the highway bridge be deepened to 30 feet between the pierheads and deep water; that a basin 20 feet deep be provided opposite the Naval Reserve wharf on the right side of the river; that the eroding bank in the vicinity of Dames Point and New Berlin be revetted; and that existing channel widths below Drummond Creek cut be maintained. The division engineer proposes to establish a new harbor line along the left side of the river which will be a combined pierhead and bulkhead line following the Commodore Point bulkhead to the lower tangent, thence following a line 250 feet landward of the westerly edge of Terminal Channel, and in general connecting the outer ends of the longest piers in other reaches. He recommends, subject to certain conditions of local cooperation, that Terminal Channel be widened 190 feet on its westerly side to a line 60 feet riverward of the

new harbor line, the dredging to be extended from the present lower end of the channel to the mouth of Long Branch; that a straight channel 200 feet wide and 26 feet deep be provided 60 feet riverward of the bulkhead along the south side of Commodore Point terminals, terminating in deep water at each end; that the basin between the highway bridge and Laura Street be deepened to 28 feet from deep water to within 60 feet of the new harbor line; that a basin 20 feet deep be dredged to within 60 feet of the Naval Reserve wharf; that existing channel widths below Drummond Creek cut be maintained; and that revetment of the banks in the vicinity of Dames Point and New Berlin be not undertaken.

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
SOUTH ATLANTIC DIVISION,
Richmond, Va., November 19, 1940.

Subject: Review of previous reports on St. Johns River, Fla., Jacksonville to the ocean.

To: The Chief of Engineers, United States Army.

1. *Authority.*—This report is submitted in compliance with the following resolutions:

(*a*) Resolution adopted June 9, 1937:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the reports on the St. Johns River, Fla., from Jacksonville to the ocean, submitted in House Document No. 483, Seventieth Congress, second session, and subsequent reports, with a view to determining if further improvement is advisable at the present time.

(*b*) Resolution adopted March 16, 1939:

Resolved by the Committee on Rivers and Harbors of the House of Representatives, United States, That the Board of Engineers for Rivers and Harbors created under section 3 of the River and Harbor Act, approved June 13, 1902, be and is hereby, requested to review the reports on St. Johns River, Fla., submitted April 1, 1937, and previous reports, with a view to determining if it is advisable to make any change in the recommendations heretofore made in regard to the area in the vicinity of Dames Point and New Berlin.

2. The River and Harbor Act of June 5, 1920, authorized a preliminary examination and survey of St. Johns River, Fla., from Jacksonville to the ocean. House Document No. 483, Seventieth Congress, second session, contains a report on the survey made under that authority. The recommendation therein that the bend in the channel at Dames Point be widened was adopted as a modification of the project. The report submitted April 1, 1937, was a report in review of a report submitted July 17, 1933. The latter report was a review of a report on survey made in compliance with the River and Harbor Act of July 3, 1930, which provided for a preliminary examination and survey of the St. Johns River, Fla., in the general vicinity of Dames Point and New Berlin, with a view to ascertaining the cause of the erosion of the upland, and with a view to devising remedies to prevent same, and to protect the upland against any further recession of the shore line. Consideration was given in these reports to the cause of the erosion of the upland, and remedies to prevent such erosion in the vicinity of Dames Point and New Berlin. The reports were unfavorable to any improvement to prevent erosion at Dames Point and New Berlin.

3. *Description.*—St. Johns River rises in Brevard County in the east central part of Florida. It flows northerly for 257 miles to Jacksonville, thence easterly 28 miles to the Atlantic Ocean, a total dis-

tance of 285 miles. The watershed is about 40 miles wide and 200 miles long; it has an area of 8,160 square miles. The 83-mile reach below Palatka consists of a long lagoon varying in width from one-half mile to 3 miles. The part of the river between Palatka and Sanford consists of a series of lakes connected by a wide sluggish river channel. Lake Harney, 198 miles above the mouth, is approximately at mean sea level during low water; during extreme high tides the water has been known to flow upstream into this lake. Lake Helen Blazes, 285 miles above the mouth, is about 11 feet above mean sea level during low water. Usual fluctuations in river stages at representative points are as follows:

TABLE 1.—*Usual river stage variations*

Mile	Location	Mean tidal range (feet)	Mile	Location	Mean tidal range (feet)
0	Mouth of river	5.3	83	Palatka	2.0
3.5	Mayport	4.3	115	Lake George	8.0
14	Dames Point	2.2	173	Sanford	7.8
28	Jacksonville	[1] 1.9	198	Lake Harney	9.5

[1] Usual flood stage above ordinary low water.

4. Due to its favorable widths and slope, the St. Johns River is an excellent natural waterway as far upstream as Sanford. Channel improvements for navigation have been provided as follows:

TABLE 2.—*Navigation channel depths*

Mile to mile	Reach of river	Project depth at low water (feet)
0 to 28	Mouth to Jacksonville	30
28 to 83	Jacksonville to Palatka	13
83 to 173	Palatka to Sanford	8
173 to 198	Sanford to Lake Harney	5

The Intracoastal Waterway from Boston, Mass., to Corpus Christi, Tex., crosses St. Johns River about 5 miles above its mouth. The section of the river under consideration is shown on United States Coast Chart 577 and on the accompanying maps.

5. Dames Point, located on the left bank of St. Johns River about 11 miles below Jacksonville, is the site of several private residences. The dredged navigation channel at this point is about 150 feet offshore. At New Berlin, a mile below Dames Point, there are about 14 residences. In this vicinity the dredged channel is from 300 to 450 feet offshore. At both Dames Point and New Berlin, steep bluffs rise from 10 to 18 feet above the water. At Commodore Point, on the left bank of the river about 2 miles below the county bridge, the river turns sharply from an easterly to a northerly course.

6. *Tributary area.*—Jacksonville is the most important commercial and industrial center in north Florida. It had a population of 146,500 in 1935. The city serves particularly as a collecting and distributing center for large parts of the State and of southern Georgia. In addition to its wholesale warehouses and yards, it has a number of important manufactures, among them six large fertilizer plants, a large

paper mill, gypsum plant, coffee-roasting plant, cigar factory, and many smaller foundries, machine shops, and other plants serving a wider area than the city itself.

7. Four main railroads lead into Jacksonville from the north and west, and three extend south through Florida. Four main paved highways lead to Jacksonville from the north and west, and extend south through Florida. The city has an excellent municipal airport located about 6 miles north of the center of town.

8. The area commercially tributary to the harbor of Jacksonville includes most of peninsular Florida and a considerable area of south Georgia. About 1,000,000 inhabitants of that area do some or all of their business through Jacksonville, and contribute to its economic importance. The population of Florida has increased rapidly in recent years, from 528,542 in 1900 to 1,606,842 in 1935, and it seems likely that this growth will continue for some time in the future. The commercial importance of Jacksonville will increase proportionately.

9. The principal products of the tributary area are citrus fruits, field crops, and winter vegetables, forest products (including rosin, turpentine, lumber, pulpwood, cross ties, and poles), fertilizer, fish, and other sea foods, dairy and poultry products, and fullers earth. During the 1938–39 season, over 56,000,000 boxes of citrus were produced in Florida, with a gross value of about $59,000,000. About 23,000,000 boxes were shipped out of the State by rail, 11,000,000 boxes by boat, and 7,000,000 boxes by truck; nearly 10,000,000 boxes were canned and 3,000,000 boxes consumed locally. The principal port of water shipment is Jacksonville; fruit from as far south as Pinellas, Polk, and even Lee, Counties is sent to Jacksonville by rail or truck for shipment thence in refrigerated vessels to North Atlantic ports.

10. The State production of noncitrus fruits and winter vegetables totaled 41,083 carloads, valued at over $25,000,000. Most of these are shipped to market by rail or truck, although Irish potatoes are shipped by water. Although the timber resources of the tributary area have been greatly depleted, over 100,000 tons of naval stores and a large amount of lumber were produced in 1939; over 250,000 tons of lumber were shipped out of the State by water alone, in addition to an even greater production shipped by rail or consumed within the State. Practically the entire production of naval stores of Florida and south Georgia is shipped to Jacksonville for marketing through brokers or factors located there.

11. About 500,000 tons of fertilizer are normally manufactured in Florida each year, about half of which is manufactured by six large fertilizer plants in Jacksonville. In 1939 about 120,000 tons of fertilizer materials were brought into Jacksonville by water alone. About 30,000 tons of edible fish and other seafoods are taken annually in the tributary area, and about 26,000 tons of nonedible fish used in the manufacture of fish oil, scrap, and similar products.

12. One of the principal industries of the tributary area is catering to the large number of winter residents and tourists who come to Florida for the winter months each year. It is variously estimated that these visitors spend from $150,000,000 to $200,000,000 each year in the State, and a large part of the commodities involved in their activities enters the State by rail, truck, or boat through Jacksonville.

13. Owing to the specialized nature of most of its agriculture, and

to the lack of raw materials and cheap power, Florida does not produce enough of most commodities to supply its resident and tourist population. Large quantities of consumer goods must be brought into the State from other parts of this country and abroad. Among the most important of these are petroleum products, feeds and foodstuffs, clothing, machinery, structural steel and other building materials, fertilizer ingredients, newsprint, creosote oil, and hardware. Many of these commodities, notably petroleum products, fertilizer ingredients, newsprint, and creosote oil, come to the State largely by water.

14. *Bridges.*—From its mouth to the upper limit of Jacksonville harbor at about mile 28, the river is free from bridges at present. The upstream limit of the harbor is formed by 2 bridges which cross the river side by side. A War Department instrument of approval was issued on January 18, 1937, to the Board of Commissioners of Duval County for the construction of a highway bridge across the river at the foot of Main Street, Jacksonville, about 2,500 feet downstream from the lowermost existing bridge. Features of the above-described bridges are as follows:

TABLE 3.—*Jacksonville bridges*

Location	Owner and service	Movable span (type)	Clearances	
			Horizontal (feet)	Vertical above low water (feet)
Immediately above United States Highway No. 1.	Florida East Coast Ry.	Single leaf bascule	195	7.1 (closed), unlimited (open).
United States Highway No. 1	State Road Department highway.	Through truss lift span.	174	56 (closed), 165 (open).
Main St.[1]	Duval County highway.	do	350	41.43 (closed), 139 (open).

[1] Bridge under construction.

Work on the bridge at the foot of Main Street began February 16, 1938. This bridge will have no effect on that part of the proposed improvement for navigation at and below Commodore Point, or at the Naval Reserve Armory. The operators of the McGiffin Terminal, located above the new bridge, state, however, that vessels docking at terminals above the bridge and adjacent thereto must be assisted by tugs.

15. *Prior reports.*—Prior reports on St. Johns River, Jacksonville to the ocean, are listed in table 4.

TABLE 4.—*Prior reports on St. Johns River, Fla., Jacksonville to the ocean*

Locality	Preliminary examinations		Surveys			Where published					
	Date of report	Recommendation	Date of report	Estimated cost	Recommendation	Congress documents				Annual reports Chief of Engineers	
						House or Senate	No.	Congress	Session	Year	Page
Mouth			Jan. 29, 1869	$10,000						1869	266
Jacksonville to ocean			Mar. 25, 1872							1872	672
Mouth			June 30, 1879	120,000	Favorable					1879	767
				800,000							
				1,306,409							
Jacksonville to ocean			Feb. 18, 1895	2,109,750	do	House Eexecutive.	346	53	3	1895	1,586
St. Johns River, Fla., Jacksonville to ocean.	Apr. 30, 1909	Favorable	Dec. 4, 1905	371,000	do	House	663	59	1		
			Nov. 22, 1909	2,652,000	do	do	611	61	2		
Jacksonville to ocean	June 20, 1922	do	Dec. 6, 1928	111,000	do	do	483	70	2		
Do			June 5, 1935	168,000	do	Senate					
				506,000		Committee		74	1		
Dames Point and New Berlin	Nov. 1, 1930	Favorable to survey.	July 17, 1933	80,000	Unfavorable		(1)	(1)	(1)	(1)	(1)
Do			Apr. 1, 1937	88,000	do		(1)	(1)	(1)	(1)	(1)

(1) Not published.

16. *Existing project.*—The existing project provides for a navigation channel from the ocean to Jacksonville obtained by jetty and mattress work at the river entrance, dredging between the jetties and on the ocean bar, dredging and rock excavation in the river, and stone training walls and shore protection where required. Project dimensions and the comparable existing dimensions are given in table 5, listed progressively from the ocean to Jacksonville, in accordance with locations shown on sheet 1 of the accompanying maps.

TABLE 5.—*Project dimensions and actual dimensions*

Designation of dredged cut or channel	Authorized dimensions		Actual dimensions	
	Depth	Width	Depth	Width
	Feet	*Feet*	*Feet*	*Fee*
Between jetties, including bar cut	30	600	30	800
Pilot Town cut	30	300	30	950
Mayport anchorage	30	1,100	30	1,335
Mayport cut	30	300	30	1,050
Sherman cut	30	300	30	650
Mile Point cut	30	600	30	650
White Shells Bend	30	600	30	475
White Shells cut	30	300	30	400
White Shells-Fulton Bend	30	600	30	1,000
Fulton cut	30	300	30	800
Clapboard Creek Bend	30	600	30	1,115
Clapboard Creek cut	30	300	30	1,115
Browns Creek cut	30	300	30	750
Browns Creek Bend	30	600	30	1,000
San Carlos Creek cut	30	300	30	900
New Berlin cut	30	300	30	875
Dames Point cut	30	1,200	30	1,400
Brills cut	30	300	30	450
Dunns Creek Bend	30	600	30	875
Dunns Creek cut	30	300	30	625
Drummond Creek cut	30	400	30	400
Drummond-Trout Creek Bend	30	[1]	30	850
Trout Creek cut	30	400	30	400
Long Branch cut	30	400	30	400
Long Branch Bend	30	[1]	30	650
Arlington cut	30	300	30	300
Terminal Channel [2]	30	400	30	400

[1] As required.
[2] Inshore edge of channel about 200 feet from pierhead line.

17. In addition to the above-tabulated work, the existing project provides for removing, to a depth of 24 feet at mean low water, rock and overlying material between the 24-foot depth curve and the pierhead line at Jacksonville from the Florida East Coast Railway bridge to Hogan Creek, a distance of 6,080 feet. The project is further subject to such modifications in details as the Chief of Engineers may deem advisable. The project was completed in 1937. The total cost to the United States of the improvement to June 30, 1940, has been $17,960,397.28, of which $8,779,861.84 was for new work and $9,180,-535.44 for maintenance

18. At New Berlin, about 550 feet of revetment was constructed in 1909 under Government contract along the foot of the highest section of the bluff. It consisted of a brush mattress 40 feet wide weighted with stone and placed immediately below the low-water line, and has prevented material erosion of the section of the bluff behind it. Expenditures under the contract amounted to $15,773.55, of which about one-third was for revetment repairs at St. Johns Bluff. Proposed

operations for the fiscal year 1925 included an estimate of $101,050 for construction of shore protection at Dames Point and New Berlin. It was subsequently found that this work was unnecessary in the interest of navigation and the revetment was not constructed.

19. *Local cooperation.*—No cooperation by local interests is required under the existing project. Local interests have made no offer to contribute toward the cost of the improvements now requested, except to provide such areas as may be required for the disposal of spoil, and to assume responsbility for possible damage to existing wharves and piers which might result from the proposed dredging.

20. *Other improvements.*—Between 1892 and 1894, Duval County expended $303,206.25 in building training walls and shore protection works and in dredging between Dames Point and Mile Point to secure an 18-foot channel throughout this 10-mile stretch. Between 1904 and 1930, local interests claim to have spent over $360,000 in dredging and maintaining Terminal Channel, a channel along the wharves which was later included in the existing project and dredged by the United States. During 1937, a basin about 125 feet wide and 1,900 feet long was dredged by the owner along the easterly side of Commodore Point terminals and connected with the main river channel by a dredged approach 800 feet wide, at a combined cost of about $51,000.

21. Data heretofore submitted by local interests show that the various companies owning or operating terminals along the river front have spent about $396,300 on the dredging of new channels connecting their terminals with the ship channel and that, during the 10-year period between 1925 and 1934, about $565,410 was spent by them on maintenance of those channels, an annual average of about $56,500. Practically all of this money was spent at and below Commodore Point. Recent reports show expenditures for maintenance of side channels between Long Branch and Commodore Point, including the latter, to have been about $47,500 annually from January 1, 1937, to August 31, 1940. This includes annual charges on two earth bulkheads constructed at one terminal at a cost of $21,000 for the purpose of reducing maintenance dredging.

22. *Terminal and transfer facilities.*—There are 62 wharves and terminals at Jacksonville which provide berthing space aggregating 44,117 feet in length. Adjacent navigation depths range from 3 to 30 feet at mean low water, with the majority of the piers having depths in excess of 20 feet. Types of construction used are shown in the following table:

TABLE 6.—*Type of piers at Jacksonville*

Type of construction	*Number of wharves*
Timber on timber foundation piles	54
Steel sheet piling with earth-filled bulkhead	5
Wood and concrete	2
Steel and concrete with earth fill	1
Total	62

23. Of the above water terminals, 54 are located below the existing bridges, 44 are on the left and 10 are on the right side of the river.

Ownership of the Jacksonville wharves below the State highway bridge is divided as follows:

TABLE 7.—*Ownership of Jacksonville wharves*

Wharf owner	Number owned	Berthing space (feet)
Railroads:		
Atlantic Coast Line R. R	6	
Florida East Coast Ry	3	
Seaboard Air Line Ry	2	
St. Johns River Terminal Co	4	
Total	15	11,672
Steamship companies:		
Agwilines Inc. (Clyde-Mallory Lines)	4	
Merchants & Miners Transportation Co	1	
Total	5	4,730
Municipal:		
Pier No. 1, 890 feet long by 245 feet wide	1	1,778
Pier No. 2, 960 feet long by 230 feet wide	1	1,950
Pier No. 3, 975 feet long by 345 feet wide	1	2,220
Total	3	5,948
Other owners:		
Commodore Point Terminal Corporation	1	[1] 5,080
Miscellaneous private piers	29	
Naval Reserve pier (Duval County)	1	
Total	31	
Grand total	54	

[1] Shoaling has reduced this space to about 3,600 feet.

24. The above-listed wharves are in use about as follows:

TABLE 8.—*Usage of Jacksonville wharves*

Use	*Number of wharves*
Petroleum products, bulk storage	6
Fertilizer and fertilizer materials	6
Oceangoing general cargo	10
Water-rail cargo transfer	6
Automobile assembly	1
Coastwise and export lumber	1
Creosoting and shipping of timber	1
Coal bunkering	1
Repair of large vessels	6
Repair of small vessels	3
Inland waterway general cargo	3
Handling oyster shells	2
Fishing boats and fish markets	1
Fueling of small vessels	1
Automobile storage	1
U. S. Engineer Department	1
U. S. Naval Reserve	1
Unused	3
Total	54

25. Municipal Pier No. 1 is leased to the Refrigerated Steamship Lines; a large precooling plant has been erected thereon, and it is used for the handling of citrus fruit. It is also connected by pipe lines with the near-by storage tanks of the Sun Oil Co. and National Oil Co. Pier No. 2 is equipped with two modern transit sheds 73 feet wide and 800 feet long. Across Talleyrand Avenue from these

piers is a cotton warehouse, 96 by 420 feet, equipped with two high-density cotton compresses. Municipal Pier No. 3 has a modern transit shed 100 feet wide and 800 feet long, equipped for handling naval stores. On shore there are 9 steel tanks for storage of turpentine, connected with the pier by pipe lines. Adjacent thereto is open storage space of about 70 acres, of which 40 acres are devoted to naval stores. Each of the three piers has railroad tracks running the entire length and connecting with the Municipal Docks Terminal Railroad system, which is a common carrier and connects with all trunk lines entering Jacksonville. Two standard locomotives, rolling stock, track scales of 150 tons capacity, and a 35-ton crane with magnet comprise part of the equipment of the municipal piers. Reports from public terminal operators indicate that terminal facilities for movement of high-value commodities are sufficient for present needs and probably adequate to accommodate traffic expansion which may be expected for a number of years.

26. Of the privately owned piers and wharves at Jacksonville, those of the Commodore Point Terminal Corporation are the largest, covering approximately 135 acres. There are general warehouses leased to various tenants for storage and industrial purposes; 4 ship-side frame sheds with total area of 180,000 square feet for lumber in transit; and 2 ship-side warehouses, both of modern construction provided with electric trucks and locomotive cranes. Due to shoal water, about 2,700 feet of the improved water-front bulkhead along the south side of Commodore Point is little used. Access to this bulkhead is reported to be seriously needed now, as it affords the most suitable place for handling low-value, open-storage, water-borne commodities.

27. The municipal piers, owned by the city of Jacksonville, and the wharves of the Commodore Point Terminal Corporation, are open to all on equal terms. Owners of many of the other piers permit their use by other parties, subject to mutually satisfactory agreements. No special facilities for recreational boating have been provided at the port of Jacksonville, such as yacht basins or piers for the exclusive use of yachts. Comparatively few such boats are based at Jacksonville, and such outside boats as visit the port usually call only for supplies or repairs en route to or from the more popular yachting centers farther south. Vessels of this kind visiting the port are berthed at repair yards or such terminals as may be able to provide space, or anchored in the stream. Duval County has expended about $100,000 in providing a Naval Reserve Armory on the right bank of the river about one-half mile below the existing highway bridge, including a small pier for the use of destroyers and other naval vessels, but owing to lack of depth at the pier, it is at present of little use.

IMPROVEMENT DESIRED

28. In July 1937, the Jacksonville Chamber of Commerce requested consideration of a 35-foot channel from Jacksonville to the ocean, but this is not included in their present requests. Local interests now desire that the scope of the existing project be amplified as follows:

(1) *Terminal Channel.*—Widen Terminal Channel by 200 feet to provide a channel 600 feet wide with the inner edge coincident with

the existing pierhead line which is about 50 feet from the ends of the longest piers.

(2) *Commodore Point.*—Move the existing harbor lines shoreward between Commodore Point and the Bull Steamship terminal, and remove the entire shoal between the revised pierhead line and deep water in the river to a depth of 30 feet. They first requested that the depth be made 26 feet or to rock, but later decided that a depth of 30 feet should be provided throughout to conform with depths elsewhere in the harbor.

(3) *Basin above Laura Street.*—Remove to a depth of 30 feet the shoals off the terminals between the existing highway bridge and Laura Street, over which depths ranging from 25 to 30 feet now exist so as to provide safe access for deep-draft vessels to the terminals of the McGiffin Co. and the Atlantic Coast Line Railroad.

(4) *Naval Reserve Basin.*—Provide a basin not less than 20 feet deep at the recently constructed Naval Reserve Armory pier on the south side of the river; the basin to be about 650 feet long along the outer face of the pier and about 1,300 feet long at the 20-foot depth contour. The Navy Department concurs in this request.

(5) *Revetments.*—Revet the eroding river banks in the vicinity of Dames Point and New Berlin.

(6) *Channel widths.*—Maintain existing widths in the channels below Jacksonville, as shown in table 5, where these widths exceed the project widths, in order that the safety afforded ships by these extra widths may be assured in the future.

CLAIMS OF LOCAL INTERESTS

29. *Terminal Channel.*—Local interests state that the area between Terminal Channel and the piers is from 12 to 15 feet deep and that the approach channels dredged through this area to the terminals are subject to rapid shoaling because of the undredged intervening areas and cross currents; that they are expensive to maintain; that, owing to the narrowness of Terminal Channel and the sharp turns which ships must make to reach the terminals, numerous groundings have occurred in these cross channels; that, in order to avoid groundings, deeper draft vessels using the wharves must lighter part of their cargoes or discharge part of each cargo at another port before entering the Port of Jacksonville; and that the condensers of vessels are frequently clogged by silt.

30. The Mexican Petroleum Corporation, Standard Oil Co., Eppinger & Russell Co., and Wilson & Toomer Fertilizer Co. report that part of the cargo of large incoming vessels is lightered before the vessels attempt to enter their berths. The Seaboard Oil Co., Sinclair Refining Co., and the Atlantic Refining Co. report that their larger vessels avoid the port or discharge part of their cargo before coming to Jacksonville. The annual cost of such lightering and rail transportation is estimated at $54,200. It is claimed that of 409 vessels entering Jacksonville at night, 222 (54.3 percent) were over 350 feet long, and that the present width of Terminal Channel is insufficient for safely turning such vessels. It is stated that at night and in foggy weather ships and small vessels use Terminal Channel

as a through channel for safety, thereby causing considerable hazardous congestion in this channel.

31. A representative of the city administration claims that widening Terminal Channel would permit development of an additional mile of city-owned water-front property; would reduce the cost of handling naval stores over the municipal docks by from $15,000 to $25,000 annually; would reduce the annual cost of side channel dredging by from $12,000 to $15,000 and eliminate the need for a fuel-oil pipe line from the municipal docks to the city steam electric plant, which now costs about $6,000 per year to maintain; that it would practically eliminate present annual expenses of from $10,000 to $15,000 resulting from silt and refuse clogging the water intake tunnel and injuring the condensers; and that the cooler water made available would effect a saving in cost of power production amounting to several thousand dollars annually.

32. *Commodore Point.*—Officials of the Commodore Point Terminal Corporation report that during 1918 they dredged a channel 26 feet deep and 200 feet wide along the bulkhead on the south side of the point. The channel shoaled rapidly and was redredged 11 times between 1918 and 1936. Since early in 1937 a channel only 50 feet wide and 16 feet deep has been maintained. It has been necessary to redredge this smaller channel every 3 months. A total of $133,100 has been spent on this channel. They claim that the wharfage space along that bulkhead is now of little use; that the improvement requested would make the bulkhead available for docking vessels where space is convenient for handling low-class, open-storage commodities such as stone, lumber, scrap iron, and concrete aggregate and that it would result in easier and safer access to the wharves at Commodore Point from the basin dredged by the Terminal Corporation east of the wharves. They also claim that the tidal currents would follow the new channel, which would therefore not shoal rapidly as does the existing channel which dead ends in the shoal.

33. On January 9, 1940, the Munson Line steamer *Mundixie*, after discharging fertilizer and materials at Commodore Point, ran aground between the pierhead line and Terminal Channel just south of the channel leading into Commodore Point. This grounding resulted in the loss of 10½ hours and an expense of $550 for the services of three tugs. Another vessel grounded in the channel along the bulkhead west of Commodore Point on September 23, 1939, after having taken on 2,500 tons of lumber which produced a draft of 19 feet. It was necessary to finish loading the ship at another location, all at considerable expense.

34. Shands & Baker, Inc., reports that it abandoned a crushed-stone business involving the movement by water of 60,000 tons per year, because of the competition resulting from a reduction in railroad freight rates and lack of suitable open storage space on deep water. It is stated that, if sufficient open space on deep water were made available, a large portion of this business could be regained. The Barnett National Bank recently received inquiries regarding its property along this reach from persons in need of docking facilities, but was unable to interest them due to unsatisfactory channel conditions adjoining the property. Dantzler Lumber & Export Co. shipped more than 12,000,000 board feet of lumber during 1939 through Commo-

dore Point Terminal. It desires to expand their activity but are hampered by lack of water near the bulkhead west of Commodore Point. Under present conditions loading often has to be completed at the municipal docks at extra cost for rail transportation, or by lightering lumber from the bulkhead to deep water. Commodore Point Terminal Corporation estimates that, if deep water were provided along the westerly bulkhead, there would result an increased annual traffic of 100,000 tons of timber products and 80,000 tons of general cargo, and that its income from the portion of its terminal west of the point would increase from the present $6,000 to $40,500 annually. Local interests estimate that a total of 350,000 tons of low-class commodities would be handled on marginal wharves with a saving in switching and handling charges of $334,900 annually. Local interests claim that the type of business available does not warrant further attempts by Commodore Point Terminal Corporation to maintain the dead-end channel along its westerly bulkhead, but that, if the Government will dredge a through channel, the maintenance cost will be reduced and the work justified by the resulting further development of the water front. They also claim that night navigation will be facilitated if Terminal Channel is joined to the upper harbor by a deep channel which follows the shore line.

35. *Basin above Laura Street.*—McGiffin & Co., which has its main terminals at the Seaboard Air Line piers between the existing highway bridge and Laura Street, now leases wharfage space on deep water at Commodore Point at a cost of $15,000 annually for berthing deep-draft vessels which cannot reach its main terminals. Local interests state that if the desired improvement were made large vessels would be able to berth at the main terminals safely, thus eliminating this expense, except for the additional cost of tug hire at the main terminals, and saving the long haul by rail around the city or by truck through congested city streets. It is stated that during 1938 a vessel drawing about 25 feet was grounded in an attempt to dock at the upper terminal and that ships drawing 23 feet or more are now docked at Commodore Point because vessels of that size cannot safely reach the upper terminals. McGiffin & Co. reports that, between January 1, 1937, and December 31, 1939, 279 vessels docked at its main terminals for freight or bunker coal, and 56 were berthed at its leased terminal at Commodore Point. Of the latter, however, about one-third drew less than 23 feet and could, therefore, have docked at the Hogan Street terminals. The deepest draft reported was 27 feet 2 inches, and 7 vessels are reported drawing between 25 and 26 feet.

36. Nitrates and other fertilizer ingredients constitute a large part of the commodities handled at the McGiffin terminal. These commodities usually move in deep-draft vessels. Officials of the company believe that in the near future as many as 24 vessels drawing 24 feet or more would call at their terminals annually if a depth of 30 feet were provided. During 1939, 2 large cargo vessels originally consigned to the upper harbor were diverted to other ports due to the shoal area. They state that they have declined a number of offers to handle large passenger vessels on Caribbean and world cruises because of insufficient depth at their wharf, and think that with a depth of 30 feet several such vessels would call at Jacksonville each year with considerable resulting benefits to the port. Officials of the

Atlantic Coast Line Railroad Co. state that they have trouble keeping tenants at their docks near the existing highway bridge because of the shallow water, and that, although improvements have been made in slips at this location, boat traffic is still handicapped by a submerged knoll in the river between the McGiffin warehouse and the bridge. They are now providing a depth of 25 feet in a slip for use by the United Fruit Co. Local interests claim that, with the trend of ship construction toward larger vessels, lack of depth in the upper harbor increasingly handicaps desired commercial expansion, and that ship movements in the upper harbor will be further complicated by vessels proceeding to and from the naval air station at Black Point.

37. *Naval Reserve Basin.*—The Naval Reserve Armory and pier are owned by Duval County and are leased for a period of 25 years to the Federal Government for Naval Reserve purposes. Existing depths at the pier are only about 7 feet. Local interests state that practically all naval vessels calling at the port are unable to dock at the pier and must anchor in the stream unless private berths are provided. The British cruiser *Orion* was required to pay three towage charges during a visit of 1 week when compelled to give way to tankers arriving to occupy the borrowed docking space. They claim that when anchored in the stream, steam-propelled vessels are unable to make repairs and therefore commanders of such naval vessels are inclined to avoid the port. Local representatives of the United States Naval Reserve claim that the basin and wharf would provide for a number of destroyers and other Government vessels, including those stationed at the new naval air station above Jacksonville; that the value of the improvement to naval vessels, based on usual wharfage charges, would be equivalent to $2,040 annually; and that the city would benefit from expenditures made by these boats estimated at about $300 per day per destroyer. It is stated that in the past the port of Jacksonville has been requested to furnish berths at one time for as many as six destroyers or training cruisers with cadets aboard. Submarines and destroyers frequently visit the port as do also a considerable number of Coast Guard patrol boats and cutters. A local representative of the United States Coast Guard states that it has been practically impossible to find berthing space near city transportation facilities, and recommends favorable consideration of the proposed work. The Navy Department in letter to the Secretary of War dated March 6, 1940, recommended favorable consideration of the improvement.

38. *Revetments.*—Local interests claim that the erosion at Dames Point and New Berlin is caused primarily by the wash of passing steamers, and by the operations of the United States in providing the channel in the river; that it has destroyed 55 percent of the original water-front lots and diminished the value of the remainder of their property; and that it has put them to considerable expense in moving their houses and caused some to be abandoned.

39. *Commerce.*—The commerce of the harbor at Jacksonville for the 22 years preceding 1940, as given in the annual reports of the Chief of Engineers, is summarized in table 9.

TABLE 9.—*Comparative statement of traffic*

Year	Vessel traffic		Rafted		Total		Passengers
	Tons	Value	Tons	Value	Tons	Value	
1918	1,459,556		31,463		1,491,019	$99,901,781	32,290
1919	1,667,827		4,400		1,672,227	134,664,391	31,613
1920	2,504,488	$135,057,140	3,002	$44,999	2,507,490	135,102,139	67,513
1921	1,871,981	78,704,084	53,021	232,667	1,925,002	78,936,751	45,250
1922	2,251,729	114,952,867	98,397	289,432	2,350,126	115,242,299	85,079
1923	2,856,740	168,212,065	84,494	903,077	2,941,234	169,115,142	67,195
1924	2,748,350	169,398,635	26,596	335,112	3,266,276	273,281,161	88,751
1925	3,157,356	214,536,960	6,666	53,328	3,104,022	214,590,288	91,733
1926	3,314,337	187,846,899	4,902	58,824	3,319,239	187,905,723	67,536
1927	3,709,888	218,789,032	3,864	46,368	3,713,752	245,975,610	56,754
1928	3,134,692	186,189,634	5,000	165,000	3,139,692	186,354,634	69,606
1929	3,306,754	186,607,516	None		3,306,754	186,607,516	49,500
1930	3,538,357	197,478,181	None		3,538,357	197,478,181	47,759
1931	2,103,152	97,705,277	None		2,103,152	97,705,277	50,480
1932	2,089,855	80,550,512	3,751	13,128	2,093,606	80,563,640	1,610,138
1933	2,757,859	104,303,218	15,222	48,366	2,773,081	104,351,584	1,143,725
1934	3,060,648	135,080,950	12,704	44,464	3,073,352	135,125,414	1,198,378
1935	3,020,922	163,180,418	9,085	36,340	3,030,007	163,216,758	1,229,502
1936	3,497,755	170,304,849	14,095	58,084	3,511,850	170,362,933	953,755
1937	3,461,003	194,247,372	7,969	98,375	3,468,972	194,345,747	1,036,278
1938	2,874,301	169,979,116	4,680	54,582	2,878,981	170,033,702	177,092
1939	3,311,241		2,087		3,313,328		76,054

40. Statistics for ocean-borne traffic of the harbor of Jacksonville for the years 1933 through 1939 are given in table 10. From the tabulation it appears that except for 1938 and 1939, the port of Jacksonville exported to foreign countries more than it imported, and consistently received coastwise more than it shipped.

TABLE 10.—*Ocean-borne traffic*

	1933	1934	1935	1936	1937	1938	1939
	Tons	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*	*Tons*
Imports	165,438	161,166	176,340	262,526	262,852	267,501	341,010
Exports	286,266	310,630	278,507	283,327	296,315	174,014	192,305
Coastwise receipts	1,146,732	1,342,002	1,379,510	1,578,267	1,558,484	1,396,406	1,532,737
Coastwise shipments	664,699	891,904	792,819	747,773	706,363	572,089	657,161
Total	2,263,095	2,705,702	2,627,176	2,871,893	2,824,014	2,410,010	2,723,213
Cargoes in transit	521,134	769,833	999,102	927,340	996,250	798,991	840,282

41. During 1939, the principal items imported were 99,292 tons of fertilizer materials, 73,833 tons of gypsum, 59,156 tons of bananas, 21,113 tons of creosote oil, 19,261 tons of newsprint paper, 14,428 tons of coffee, 12,344 tons of fuel oil, and 9,720 tons of sugar. Important items exported were 52,659 tons of lumber, 33,730 tons of scrap iron and steel, 32,156 tons of rosin, 20,662 tons of crushed oyster shell, 14,456 tons of fuel oil in ships bunkers, and 8,759 tons of turpentine. The largest item received coastwise was 1,108,681 tons of petroleum products, followed by 37,938 tons of foods in cans and glass, 28,370 tons of flour, 24,222 tons of new automobiles and parts, 20,624 tons of fresh and dried vegetables, 18,792 tons of fertilizer materials, and 15,028 tons of sulfur. The chief items shipped coastwise were 280,036 tons of fresh citrus fruit, 65,960 tons of fuel oil in ships bunkers, 53,853 tons of lumber, 44,500 tons of rosin, 41,081 tons of pulpboard, and 30,650 tons of potatoes. Thus about 45 percent of the ocean-borne tonnage of the harbor consisted of petroleum products, 10 per-

cent of fresh citrus fruit, 5 percent of fertilizers and fertilizer ingredients, 4 percent of lumber, and 3 percent of naval stores, these 5 items accounting for two-thirds of the ocean-borne tonnage of the port.

42. During 1939, internal receipts and shipments of the port of Jacksonville were 239,359 tons and 248,284 tons, respectively. Roughly, half of this commerce moved over the St. Johns River between Jacksonville and Sanford, and half over the Intracoastal Waterway between Fernandina and the St. Johns River. Principal receipts were 124,510 tons of oyster shells, 25,955 tons of naval stores, 25,594 tons of sand, and 14,900 tons of fresh citrus fruit; the principal shipments were 187,480 tons of petroleum products, 23,185 tons of miscellaneous feeds and foodstuffs, and 6,547 tons of fertilizers.

43. During 1939, local traffic in Jacksonville Harbor not otherwise included in this report totaled 102,472 tons, including 41,391 tons of general freight lightered between terminals and shipside, but excluding 19,032 tons of fuel oil barged to shipside for bunkering.

44. A comparative study of the data on the commerce of Jacksonville Harbor reveals that, with the exception of the depression years 1931 and 1932, the annual commerce of the port has remained practically static since 1925 at between three and three and one-half million tons (table 9). The annual ocean-borne tonnage has remained practically unchanged for the past 6 years (table 10). Although the ocean-borne commerce may be expected to increase slowly in the future with the growth in population of the tributary area, there is no indication that any considerable increase may be anticipated in the immediate future.

45. The trends of the ocean-borne commerce are exemplified by the following table, showing the tonnages of several of the more important classes and commodities which moved through the port in 1920 and in each of the past 10 years.

TABLE 11.—*Comparative tonnages of principal commodities*

Year	In-bound			Out-bound				
	Petroleum products	Fertilizers and materials	Vegetable food products	Naval stores	Other forest products	Citrus fruit, fresh	Scrap iron	Oyster shell, ground
1920	581,222	198,447	9,940	194,795	862,910	8,680		
1930	937,534	139,905	114,290	174,029	440,114	9,014	27,716	14,865
1931	819,987	108,069	103,246	117,116	182,419	41,441	2,671	17,641
1932	781,308	99,075	108,929	137,371	172,647	48,873	3,535	47,498
1933	823,447	139,405	160,577	165,381	156,490	206,844	41,304	52,213
1934	930,467	119,762	212,105	130,235	196,276	340,428	97,018	46,530
1935	901,412	111,248	239,540	146,981	193,761	277,867	70,953	44,263
1936	1,094,143	140,528	255,278	141,500	212,806	187,167	76,559	85,369
1937	1,074,312	154,403	251,799	121,903	233,125	226,778	115,630	43,456
1938	1,004,681	120,557	218,800	95,059	117,527	203,354	40,241	21,869
1939	1,121,025	119,376	235,604	99,149	122,532	282,238	33,730	23,338

46. After due allowance for the depression years 1931 and 1932, the foregoing table evidences, with minor fluctuations, the following chief trends:

(*a*) A progressive increase in petroleum products and vegetable food products. These are consumed within the area, and would therefore be expected to continue to increase along with other similar consumer goods as the population grows.

(*b*) No marked progressive change in fertilizer materials.

(*c*) A progressive decrease in naval stores and other forest products, such as might be expected to accompany the depletion of the timber reserves of the State. Although reforestation is being introduced in some areas, further decrease is more likely than increase for many years.

(*d*) No marked progressive change in citrus fruit since water transport first became important in 1933.

(*e*) A progressive increase in scrap iron and oyster shell to 1936 or 1937, followed by a marked falling off. In the case of scrap iron, the recent decrease may be due in part at least to the fact that the active demand and high prices from 1934 to 1937, inclusive, led to the combing of the State and the marketing of the accumulation of many years; so that it now becomes available only as fast as it naturally accumulates. However, the decrease in such shipments may also have been due in part at least to economic conditions abroad preceding the war. The recent requirement of licenses for the export of scrap iron will doubtless further curtail such shipments so long as it remains in force.

47. *Vessel traffic.*—The oceangoing vessels which made use of the port during 1939 are classified by drafts in table 12 below. Net registered ratings of vessels total 4,384,815 tons. This table does not include smaller craft which plied the harbor in internal and local traffic, neither of which is pertinent to the improvements requested.

TABLE 12.—*Trips and drafts of oceangoing vessels*

Draft (feet)	In-bound trips				Out-bound trips			
	Steamers	Motor vessels	All others	Total	Steamers	Motor vessels	All others	Total
29.5	1	0	0	1	0	0	0	0
28 to 29.3	15	1	0	16	2	1	0	3
26 to 28	66	3	0	69	14	1	0	15
24 to 26	43	4	0	47	455	2	0	457
22 to 24	74	2	0	76	152	4	0	156
20 to 22	156	5	0	161	373	5	0	378
18 to 20	828	3	1	832	117	0	2	119
16 to 18	135	1	5	141	139	6	6	151
14 to 16	148	4	11	163	120	0	14	134
12 to 14	126	21	3	150	159	20	4	183
Under 12	46	94	14	154	107	99	8	214
Total	1,638	138	34	1,810	1,638	138	34	1,810

48. The Coast Guard and naval vessels which called at the harbor of Jacksonville during 1939 are listed below:

TABLE 13.—*Trips and drafts of Coast Guard and naval vessels, 1939*

Name of vessel	Activity	Draft	Number of round trips	Average length of stay in port	Where docked
Tallapoosa	Coast Guard	11 feet	8	1 day	Commodore Point or Merrill-Stevens.
Agassiz	do	9 feet	4	do	Do.
Vigilant	do	do	6	do	Do.
Pandora	do	9 feet 6 inches	2	2 days	Do.
Nemesis	do	do	1	do	Do.
CG–131	do	4 feet	(1)	Bases at South Jacksonville.	Naval Reserve dock, South Jacksonville.
CG–186	do	do	24	1 day	Do.
Mojave	do	16 feet 6 inches	2	3 days	Merrill-Stevens or Williamson tie dock.
Blue	U. S. Navy	18 feet	1	4 days	Commodore Point.
Jarvis	do	do	1	do	Do.
Helm	do	do	1	do	Do.
Henley	do	do	1	do	Do.
Lang	do	do	1	3 days	Do.
Broome	do	16 feet	1	2 days	Bull Steamship dock.

[1] All year.

49. Most of the large vessels of deep draft, carrying heavy bulk cargoes, are berthed at or below Commodore Point. This condition is indicated by the following table of dockings for 1939.

TABLE 14.—*Piers used by large vessels, 1939*

Ship characteristics	Wharves above Commodore Point	Commodore Point and below	Total
Number berthed	459	592	1,051
Draft 24.1 feet or greater	10	163	173
Draft 24 feet or less	449	429	878
Length 390 feet or greater	110	322	432

About 65 percent of the ocean-borne tonnage moves through terminals at or below Commodore Point. With the exception of the Seaboard Air Line Railway terminals, occupied by McGiffin & Co. and the Atlantic Coast Line Railroad terminals, portions of which are leased by the United Fruit Co. and the Williamson Tie Co., the terminals upstream from Commodore Point are used by lighter draft coastwise shipping carrying smaller cargoes of package freight, general merchandise, and passengers.

50. Thirty-seven steamship lines are reported to have maintained service between Jacksonville and various foreign countries, including England, continental ports, West Indies, South America, Africa, East Indies, and the Far East. Sailings were as follows: Triweekly, 1; weekly, 1; monthly, 3; bimonthly, 1; irregular, 31. The number of lines offering sailings of different frequencies in coastwise service are reported as follows: 4 per week, 1; 3 per week, 1; semiweekly, 6; weekly, 5; biweekly, 4; monthly, 2; irregular, 2.

51. *Difficulties attending navigation.*—All difficulties attending navigation have been described in the preceding paragraphs on claims of local interests.

52. *Surveys.*—The regular annual surveys of the river and harbor made in connection with maintenance operations have been supplemented by special surveys. Considerable information regarding the nature of materials to be excavated in enlarging Terminal Channel is on record as a result of work executed there under the existing project, and probings to rock have recently been made. Special surveys were made during December 1938 covering areas south and west of Commodore Point, areas channelward of the terminals between Laura Street and the existing highway bridge, and areas channelward of the Naval Reserve pier. Probings have also been made in these areas.

53. A survey of the troublesome bank area at Dames Point from the foot of Center Street to a point 1,200 feet upstream was completed in May 1939 for use in preparation of this report. Before-dredging and after-dredging surveys executed in that vicinity during 1931 included elevations of the upland where it joins the foreshore over 400 linear feet of the caving bank, and elevations of the foreshore over the entire affected shore length. Estimates of loss from bank erosion at Dames Point are based on these data.

54. At New Berlin the marginal bank area was surveyed in the spring of 1931, in June 1936, and again in April 1939, over the entire affected length. These surveys permit an estimate of losses from bank

erosion. The results of the surveys are shown on the maps accompanying this report.

55. *Plan of improvement—General.*—Local interests who have expressed their views claim that the channel should be dredged as close as possible to existing piers and that such changes should be made in the harbor lines as may be necessary to accomplish this purpose. It is believed, however, that the inner edges of channels and basins should be not less than 60 feet from pierheads so that vessels can berth along pierheads without encroaching on the areas provided for navigation. Pierhead lines as now established are at considerable distances from most existing piers. This makes it necessary for local interests to dredge and maintain long approach channels to their terminals at excessive costs. These channels turn sharply from the ship channel and ships are subject to damage or grounding when attempting to make the turns into them. A new harbor line, consisting of a combined pierhead and bulkhead line, should be established landward of the existing pierhead line following the Commodore Point bulkhead to the lower tangent, thence following a line 250 feet landward of the westerly edge of Terminal Channel, and in general connecting the outer ends of the longest piers in other reaches. Such a revised combined pierhead and bulkhead line is shown on the maps accompanying this report.

56. Since, as stated above, the near edges of channels and basins should be not less than 60 feet distant from wharves or pierheads, estimates are not given for dredging to the lines proposed by local interests, but only for dredging in all channels and basins 60 feet riverward from the proposed new harbor line, except at the Naval Reserve Armory, where the limit of Federal dredging is set 60 feet channelward of the pierhead. Estimates have been prepared for dredging to the depths desired by local interests. Estimates have also been made for dredging to a depth of 26 feet along the southerly side of Commodore Point and to 28 feet in the area between the existing highway bridge and Laura Street. The inner limits of Terminal Channel would be about 10 feet riverward of the line proposed by local interests. The plan for widening Terminal Channel includes dredging between deep water and a line 60 feet channelward of the new harbor line from the present lower end of the channel to the mouth of Long Branch, and for straightening the shoreward line of Long Branch Cut at the mouth of Long Branch. The inner limits of the channel along the south side of Commodore Point terminals would be farther landward than the line proposed by local interests. Removal of the entire shoal in this reach, as requested by local interests, is not proposed, as the 200-foot channel contemplated in the estimate is considered sufficient. It is proposed to widen the entrance to this channel by producing the southerly edge of the channel along a straight line to deep water. The inner line of the basin between Laura Street and the existing highway bridge is to be from 20 to 50 feet riverward of the line proposed by local interests. The inner edge of the basin at the Naval Reserve pier is to be 60 feet riverward of the line proposed by local interests, and local interests will be required to complete the dredging to the pierhead and to maintain a depth of 20 feet in this area. It will also be necessary for them to dredge landward of the other areas to be dredged by the United States as may be necessary to reach the various terminals.

57. All estimates for dredging are based on 1 on 3 side slopes and an overdepth of 2 feet. In order to facilitate future maintenance of project depths, contracts should require a depth 1 foot greater than the proposed project depth and allow only 1 foot overdepth. No expenditures by local interests are involved except at the Naval Reserve Armory, where they are required to complete the dredging necessary to make the improvement effective. Federal annual charges include interest at 3½ percent, with amortization of first cost over a period of 50 years. Non-Federal annual charges on the cost of extending the Naval Reserve basin are estimated on a similar basis, using an interest rate of 4½ percent. The estimates are as follows:

(1) *Terminal Channel.*—Widening Terminal Channel 190 feet to a line 60 feet riverward of the proposed new harbor line:

Dredging 1,542,000 cubic yards soft material at $0.13 per cubic yard	$200, 460
Dredging 149,000 cubic yards rock at $1.25 per cubic yard	186, 250
Engineering and contingencies, approximately 15 percent	58, 290
Total cost to War Department	445, 000
Moving navigation aids	1, 000
Total Federal investment	446, 000
Increased cost of annual maintenance dredging	4, 000
Total additional annual Federal carrying charges	23, 013

(2) *Commodore Point.*—(*a*) Dredging channel 200 feet wide and 26 feet deep, 60 feet riverward of the proposed new harbor line along the south side of Commodore Point terminals, with widening opposite the tip of the point as shown on the maps:

Dredging 309,700 cubic yards soft material at $0.13 per cubic yard	$40, 261
Dredging 53,800 cubic yards rock at $1.25 per cubic yard	67, 250
Engineering and contingencies, approximately 15 percent	16, 489
Total cost to War Department	124, 000
Navigation aids	1, 000
Total Federal investment	125, 000
Increased cost of annual maintenance dredging	2, 000
Annual maintenance of navigation aids	300
Total additional annual Federal carrying charges	7, 629

(2). (*b*) Dredging channel 200 feet wide and 30 feet deep, 60 feet riverward of the proposed new harbor line from Commodore Point to the Bull Steamship terminals with widening opposite Commodore Point as requested by local interests and shown on the maps:

Dredging 610,000 cubic yards soft material at $0.13 per cubic yard	$79, 300
Dredging 130,000 cubic yards rock at $1.25 per cubic yard	162, 500
Engineering and contingencies, approximately 15 percent	36, 200
Total cost to War Department	278, 000
Navigation aids	2, 000
Total Federal investment	280, 000
Increased cost of annual maintenance dredging	2, 500
Annual maintenance of navigation aids	300
Total additional annual Federal carrying charges	16, 736

(3) *Basin above Laura Street.*—(*a*) Dredging a basin between Laura Street and the existing highway bridge to a depth of 30 feet, beginning at a line 60 feet riverward of the proposed new harbor line and extending to 30-foot depth in the river as shown on the maps:

Dredging 35,000 cubic yards soft material at $0.13 per cubic yard	$4,550
Dredging 55,000 cubic yards rock at $3 per cubic yard	165,000
Engineering and contingencies, approximately 15 percent	25,450
Total cost to War Department	195,000
Increased cost of annual maintenance dredging	1,300
Total additional annual Federal carrying charges	9,613

(3). (*b*) Dredging the same basin to a project depth of 28 feet plus 2 feet overdepth:

Dredging 28,000 cubic yards soft material at $0.13 per cubic yard	$3,640
Dredging 33,300 cubic yards rock at $3 per cubic yard	99,900
Engineering and contingencies, approximately 15 percent	15,460
Total cost to War Department	119,000
Increased cost of annual maintenance dredging	1,300
Total additional annual Federal carrying charges	6,373

(4) *Naval Reserve Basin.*—Dredging a basin 20 feet deep in front of the Naval Reserve wharf with the inner edge 60 feet riverward of the end of the wharf, and 800 feet long, flared to a width of about 1,300 feet at the 20-foot contour as shown on the maps:

Federal costs:	
Dredging 65,000 cubic yards soft material at $0.13 per cubic yard	$8,450
Dredging 12,000 cubic yards rock at $1.25 per cubic yard	15,000
Engineering and contingencies, approximately 15 percent	3,550
Total cost to War Department	27,000
New navigation aids	1,200
Total Federal investment	28,200
Increased cost of annual maintenance dredging	700
Annual maintenance of navigation aids	250
Total additional annual Federal carrying charges	2,152
Non-Federal costs:	
Extending basin to end of pier	6,000
Annual maintenance	500
Total non-Federal annual charges	804

(5) *Revetments.*—(*a*) Revetting bank in vicinity of Dames Point:

3,700 square yards of mattress at $1 per square yard	$3,700
6,250 tons of granite at $4.50 per ton	28,125
Engineering and contingencies, approximately 15 percent	4,775
Total cost	36,600
Increased annual maintenance cost	370
Total additional annual Federal carrying charges	1,930

(5). (*b*) Revetting bank in vicinity of New Berlin:

10,000 square yards of mattress at $1 per square yard	$10,000
16,950 tons of granite at $4.50 per ton	76,275
Engineering and contingencies, approximately 15 percent	12,725
Total	99,000
Increased annual maintenance cost	990
Total additional annual Federal carrying charges	5,220

58. In addition to the above features the plan of improvement contemplates maintenance of existing widths in the navigation channels below Drummond Creek cut as shown in table 5. Maintenance of these widths will not involve additional costs.

59. *Summary of costs.*—War Department first costs and total Federal annual charges on the improvements are summarized as follows:

TABLE 15.—*First costs and annual charges*

Feature	First costs	Annual charges
Widening Terminal Channel	$445,000	$23,013
Channel 26 feet deep along the south side of Commodore Point	124,000	7,629
Channel 30 feet deep, Commodore Point to Bull Steamship terminal	278,000	16,736
Basin 30 feet deep between Laura Street and county bridge	195,000	9,613
Basin 28 feet deep between Laura Street and county bridge	119,000	6,373
Basin 20 feet deep at Naval Reserve wharf	27,000	[1] 2,152
Revetment at Dames Point	36,600	1,930
Revetment at New Berlin	99,000	5,220

[1] Non-Federal annual charges $804 additional.

60. *Water power and other special subjects.*—It is not practicable to coordinate the improvement desired with projects for terminal construction, power development, flood control, irrigation, land reclamation, or other works so as to reduce the cost to the United States. The work would have no effect upon shore lines.

61. *Discussion and conclusions.*—In view of the statements by several terminal operators that there are berths at their terminals now unused, there appears to be no need for additional terminal facilities to care for the present or immediately prospective movement of the higher-class commodities. It is indicated, however, that the widths and depths in certain parts of the harbor are inadequate for the safe and economical handling of the larger vessels which call at the port and that additional marginal wharf space on deep water is needed for the handling of such low-class bulk commodities as lumber, scrap iron, concrete aggregates, and similar items.

62. *Terminal Channel.*—Certain claims of savings advanced by local interests, and stated in paragraph 31 of this report, do not appear in general to be substantiated by the facts. No appreciable savings in the handling of naval stores, scrap iron, lumber, or other open-storage commodities seem possible unless the city or other interests should construct additional marginal-wharf storage space on deep water; this would be expensive and no such improvement along Terminal Channel has been promised by local interests. Elimination of the present fuel-oil pipe line from the municipal pier to the municipal power plant would necessitate the construction of a terminal pier and pipe line at the power plant itself, and the stopping of tankers there. It seems doubtful whether the power plant could be supplied with fuel oil by that method much more cheaply than by the existing pipe line. Any benefits that might result from a wider channel in decreasing the clogging of the water-intake tunnel, or in providing cooling water at a lower temperature than that now obtained, can be realized by extending the intake tunnel to existing deeper water.

63. Terminal Channel is now 250 feet or more from the ends of the longest piers, and side channels must be provided and maintained by local interests to afford access to the terminals. The original dredging involves considerable rock excavation. Owing to the fact that these side channels are more or less normal to the river currents, the silt overlying the rock on the sides is carried into the channels and silt

carried in suspension is deposited in them; they must be redredged frequently at considerable expense. Widening of Terminal Channel by 190 feet, as proposed, would eliminate that much of each side channel and so directly reduce the extent of maintenance required. Furthermore, provision of increased cross section in the main channel would reduce current velocities both in and adjacent to the channel, and the rate of silting in the remaining sections of the side channels should thereby be somewhat reduced.

64. Records of the cost of maintenance dredging done by local interests through the area proposed to be dredged in widening Terminal Channel are not available. Estimates recently secured from terminal owners indicate the annual expenditures since January 1, 1937, to have been $5,000 by the Atlantic Coast Line, $2,439 by the Municipal Docks, $200 by the Mexican Petroleum Corp. and $1,000 by Wilson & Toomer Fertilizer Co., a total of $8,639. This cost would be eliminated by the proposed widening.

65. The narrowness of Terminal Channel hampers considerably the maneuvering of the many large ships which make use of it. Of 592 ships berthing at or below Commodore Point during 1939, 322 were between 390 and 469 feet long. Ships of that length, turning across a channel only 400 feet wide to enter or leave a side channel substantially normal to the main channel, must be handled with the utmost care, and any unfavorable combination of tide and wind may well cause them to ground. The hazard is increased by the use of Terminal Channel as a thoroughfare by other craft, large and small, particularly at night or in thick weather when the shore serves as a needed guide. Although so far no serious collisions or accidents have occurred, the danger thereof is ever present, and a single such accident might well lead to loss of life or property damage ample to warrant the expense of the widening requested.

66. Shipping agents, ship captains, pilots, and towing companies avoid publicity concerning groundings for obvious reasons. Few records of groundings are therefore available. Based on the best information that can be secured, there were nine groundings in 1937 in the Atlantic Coast Line side channel. Most of these occurred at the junction of the side channel with Terminal Channel. Losses due to these groundings were not reported. One grounding was reported to have occurred in 1939 on a shoal near municipal pier No. 1. The vessel was floated with the assistance of tugs after 8 hours and 39 minutes. The total cost incidental to the grounding is stated by the steamship line to have been $8,654.54, no details being given. As a rule groundings are much less expensive and the average loss is probably not more than $750. The average annual loss due to groundings since the completion of Terminal Channel on July 30, 1937, is estimated at $5,000. The reduction in this annual loss to be realized by the proposed widening of Terminal Channel may be assumed at $3,000.

67. Local interests claim that the proposed widening of Terminal Channel would reduce present lightering costs and the cost of routing vessels to other ports for partial unloading before entering Jacksonville Harbor. These savings can also be realized by providing adequate side channels and basins. The ocean-borne commerce below Commodore Point in 1939 included 1,121,000 tons of petroleum products and about 300,000 tons of other commodities. Larger ships

would unquestionably use Terminal Channel if it were widened and adequate side channels and basins were provided so as to reduce the danger of groundings. It is believed that the tonnage carried by 50 percent of the vessels drawing over 24 feet would be increased 5 percent at no appreciable increase in the cost of transportation, and that 2 percent of the total commerce of 1,421,000 tons below Commodore Point, or 28,000 tons, could be carried at no cost. The resulting saving is estimated at $28,000. This saving would apply mainly to petroleum products. The oil companies and most other terminal operators have no particular interest in reducing prices to their customers but they usually do so when practicable. If Terminal Channel is widened as proposed, it seems probable that most of the terminal owners will do the small amount of additional dredging necessary to provide adequate depths and widths in their side channels, and that half of the above savings, or $14,000, will be realized and passed on to the public.

68. A normal growth of the port may be expected in the future and additional terminal facilities will be needed to meet this growth. The cost of providing and maintaining those facilities will be considerably less with the wider channel, due to the shorter side channels required to reach future terminals and the reduced silting in them. Great weight should be given to the added safety and convenience to general navigation, and to the opportunity for economical future development afforded by the improvement.

69. The total of the annual tangible benefits expected to result from the proposed widening of Terminal Channel, as given in detail above, amounts to $25,639 compared to total annual charges of $23,013. The estimate of benefits is considered conservative, and the amount is sufficient to justify the improvement. Moreover, the intangible benefits in increased safety and convenience to navigation, in encouraging shipping interests to use larger ships, and in the opportunity afforded for economical future expansion of wharfage space are believed to be sufficient to justify one-half the annual charges on the improvement.

70. *Commodore Point.*—The Dantzler Lumber & Export Co. is shipping about 25,000 tons of lumber annually from the bulkhead wharf west of Commodore Point. The business is being conducted under great difficulties and uncertainties due to the rapid shoaling of the channel. It is frequently found necessary to transfer the ship to deeper water in order to complete the loading, either by lightering part of the load or by rehandling part by truck or rail to some other terminal. Despite the difficulties involved, the lumber is handled at this wharf because the available storage space close to shipside reduces rehandling costs to a minimum, and there is no other suitable space available that is not already used to capacity.

71. There are two unused berths at the municipal pier provided for the higher class of commodities but there is no suitable space available for handling bulk cargoes except naval stores. Storage space for additional bulk commodities is available landward of the piers, but extra handling charges are involved when this space is used.

72. The 26-foot channel formerly dredged along the south bulkhead at Commodore Point was found to be very expensive to maintain, and no attempt is now being made to maintain a depth greater than 18 feet. This channel is subject to rapid shoaling for the reason

that it does not extend entirely through the shoal. If a channel is dredged through the shoal to deep water, tidal flow will follow it and maintenance costs will not be excessive. As indicated above, the Dantzler Lumber Co. is able to conduct a business along this bulkhead under great difficulties because of the savings made. It is believed that if a suitable channel is maintained, other bulk commodities will be handled in this area at a considerable saving.

73. The division engineer has carefully considered a number of proposed improvements along the south side of the Commodore Point terminals, ranging from the original request of local interests that the entire shoal between the point and deep water be removed to a depth of 26 feet or to rock, to the present proposal that a channel 30 feet deep and 200 feet wide be dredged parallel to the south face of the Commodore Point terminals and thence along the shore to the vicinity of the Bull Steamship terminal. He concludes that a channel 200 feet wide and 26 feet deep parallel to and 60 feet riverward of the proposed new harbor line (estimate 2 (a)) will adequately meet the present needs at the minimum of cost to the United States. Such a channel, located as shown on the accompanying maps, would provide sufficient water along the existing marginal wharf to berth all but the largest ships calling at the port, and thereby eliminate practically all necessity for rehandling such commodities as can be moved over that terminal, and would provide additional deep water along which marginal wharves could be constructed if required. This channel will be superior to the channel requested by local interests in ease of navigation and in hydraulic characteristics, and is less expensive. The location is believed to be the most suitable one in the harbor for handling bulk commodities.

74. The Commodore Point Terminal Corporation estimates that its revenue from the westerly portion of its terminal would be increased from the present $6,000 a year to $40,500 a year by provision of a channel similar to that proposed. Other local interests claim that a saving of $334,900 annually on the rehandling of 350,000 tons of low-class commodities in the harbor would be realized. In view of the fact that the total of such commodities shipped out of Jacksonville in 1939 was only some 290,000 tons, that a decrease rather than an increase in such shipments seems likely, and that present terminals are adequate to handle at least two-thirds of that tonnage without unnecessary rehandling, it appears that the claims of local interests are too optimistic. Nevertheless, if a saving of only 50 cents a ton were realized by eliminating the necessity of rehandling 50,000 tons of such commodities a year, the total of $25,000 would be over 3 times the annual carrying charges on that section of the improvement, and this seems well within reason.

75. The total of the annual benefits estimated above amounts to $25,000 compared to total annual charges of $7,629. In addition to the tangible benefits there would be large benefits in the increased safety and convenience afforded navigation, and in the opportunity for economical future expansion of marginal wharfage space for low-class commodities. The justification of the improvement appears to be unquestionable.

76. *Basin above Laura Street.*—The existing project for the basin between the highway bridge and Laura Street was adopted many years ago, and provides for a depth of only 24 feet. The size of

vessels has greatly increased and it is now found that a number of vessels desiring to use the wharves are unable to do so because of insufficient depth. McGiffin & Co. is compelled to lease space for such vessels at Commodore Point at a cost of $15,000 annually. In addition, extra expense is involved in the transfer of freight by rail or truck. These expenses to the company would be eliminated by a deeper basin, but the additional tug hire that would be necessary at this basin would amount to $3,600 annually. The savings from this source alone are about twice the annual carrying charges. There would, of course, be a loss of $15,000 by the Commodore Point Terminal Corporation until the vacated space could be leased to other parties. The provision by the Atlantic Coast Line Railroad Co. of a depth of 25 feet in a slip at its terminals on this basin indicates the need for deeper water.

77. The total of the annual benefits estimated above amounts to $11,400 compared to total annual charges of $6,373. The terminals on this basin are convenient to the city, and it is believed that the extensive commerce which has been built up at this point and the prospective future commerce would warrant the comparatively small expenditure required to provide a depth of 28 feet, which is considered necessary for the larger vessels even if the tangible benefits were small.

78. *Naval Reserve Basin.*—The value of the proposed basin at the Naval Armory pier cannot be expressed in terms of actual monetary savings. Although it is true that, if visiting Navy and Coast Guard vessels had to pay regular wharfage charges for their berthing spaces, the cost would amount to at least the $2,040 estimated by local interests, it is equally true that such vessels are not so charged, nor do the terminal owners incur any actual loss because those vessels occupy space. However, the necessity for arranging for private berthing space, and, in some cases, of moving from one berth to another to vacate space needed by a commercial ship, imposes inconvenience, uncertainty, and some small cost upon such vessels. The construction of the naval air station at Jacksonville will doubtless increase the need for an always-available berthing space for smaller naval vessels. The cost of the basin is small, and, in view of the request of the Navy Department that the improvement be provided, it is believed that it is justified.

79. If the dredging of the basin were to be carried no nearer the pierhead than 60 feet, in accordance with the general policy laid down in paragraph 55, the entire purpose of the improvement would be nullified, inasmuch as destroyers, Coast Guard cutters, and similar craft could no more berth at the pier then than at present. It is therefore believed that local interests should be required as a measure of local cooperation to complete the dredging to the pierhead and to provide such fenders, mooring dolphins, or other additions to the pier as may be necessary, in the opinion of the Chief of Engineers, to fit it for the berthing of such vessels as may wish to use it.

80. *Revetments.*—The desired revetments at Dames Point and New Berlin would be of considerable benefit to local interests in protecting their lands from erosion. The amount of material eroded annually is estimated at not more than 20,000 cubic yards. It is believed that only a small portion of this material lodges in the channel, and that the cost of removing it is negligible compared to the annual carrying charges on the revetments. It is not believed that the United States

is liable for the damages caused by the erosion and it is accordingly concluded that the United States would not be justified in bearing any part of the cost of constructing the revetment at either place.

81. The estimated total annual charges and total tangible benefits applicable to the several improvements considered are summarized as follows:

	Annual charges	Annual benefits
Widening Terminal Channel with a depth of 30 feet	$23,013	$25,639
Channel 26 feet deep along south of Commodore Point	7,629	25,000
Channel 30 feet deep, Commodore Point to Bull Steamship terminal	16,736	25,000
Basin 30 feet deep between Laura Street and county bridge	9,613	11,400
Basin 28 feet deep between Laura Street and county bridge	6,373	11,400
Basin 20 feet deep at Naval Reserve wharf	2,956	----------
Revetment at Dames Point	1,930	----------
Revetment at New Berlin	5,220	----------

82. *Recommendations.*—Subject to the prior establishment of a new harbor line on the left bank of the river between the highway bridge and Long Branch, which will be a combined pierhead and bulkhead line following the Commodore Point bulkhead to the lower tangent, thence following a line 250 feet landward of the westerly edge of Terminal Channel, and in general connecting the outer ends of the longest piers, in other reaches, as shown on the maps, it is recommended that the existing project for St. Johns River, Jacksonville to the ocean, be modified to provide for (1) dredging a strip 190 feet wide and 30 feet deep between the westerly edge of Terminal Channel, and a line 60 feet riverward of the new harbor line, thus making this channel 590 feet wide and 30 feet deep, dredging to a line 60 feet riverward of the new harbor line from the lower end of Terminal Channel to Long Branch and straightening the channel at the mouth of Long Branch, as shown on the maps; (2) dredging 60 feet riverward of the new harbor line a new straight channel 200 feet wide, 26 feet deep, and about 4,500 feet long along the south side of the Commodore Point terminals, terminating in deep water at each end, as shown on the maps; (3) dredging at the site of the existing 24-foot basin between the foot of Laura Street and the highway bridge a basin 28 feet deep, about 1,800 feet long, and about 350 feet wide, extending from a line 60 feet riverward from the new harbor line to the 28-foot depth curve in the river, as shown on the maps; (4) dredging a basin opposite the Naval Reserve pier in South Jacksonville to a depth of 20 feet over an area extending from deep water in the river to a line 60 feet riverward from the end of the existing pier, the length to be about 800 feet at the inner side and about 1,300 feet at the 20-foot contour, with a maximum width of about 270 feet; (5) maintaining existing channel widths below Drummond Creek cut as indicated in table 5, paragraph 16, all at an estimated cost of $715,000 for new work, with $8,000 annually for increased maintenance; subject to the provision that local interests complete the dredging to the pierhead at the Naval Reserve Armory pier, provide such fenders, mooring dolphins, reinforcement, or other changes in the pier as may be required to fit it for the berthing of Navy and Coast Guard vessels, and maintain the additional dredged area and other facilities; furnish convenient spoil areas for material removed in original dredging and subsequent maintenance of the

entire project when and as required and, when it is impracticable to provide acceptable spoil areas at such distance from the work that a pipe line not over 5,000 feet long can be used, pay the excess cost of dredging due to the use of a longer pipe line or other means of disposal of the dredged material; and that abutting property owners assume full responsibility for the safety of their respective properties during dredging operations. It is further recommended that placing of bank revetment at Dames Point and at New Berlin be not undertaken by the United States.

83. For the most economical and advantageous prosecution of the work the initial allotment should be sufficient to complete the entire work. Should this be impracticable, an initial allotment of $270,000 should be made for the Naval Reserve basin, the basin at the highway bridge, and the work along the south side of Commodore Point terminals, followed by an allotment of $445,000 for Terminal Channel.

JARVIS J. BAIN,
Colonel, Corps of Engineers,
Division Engineer.

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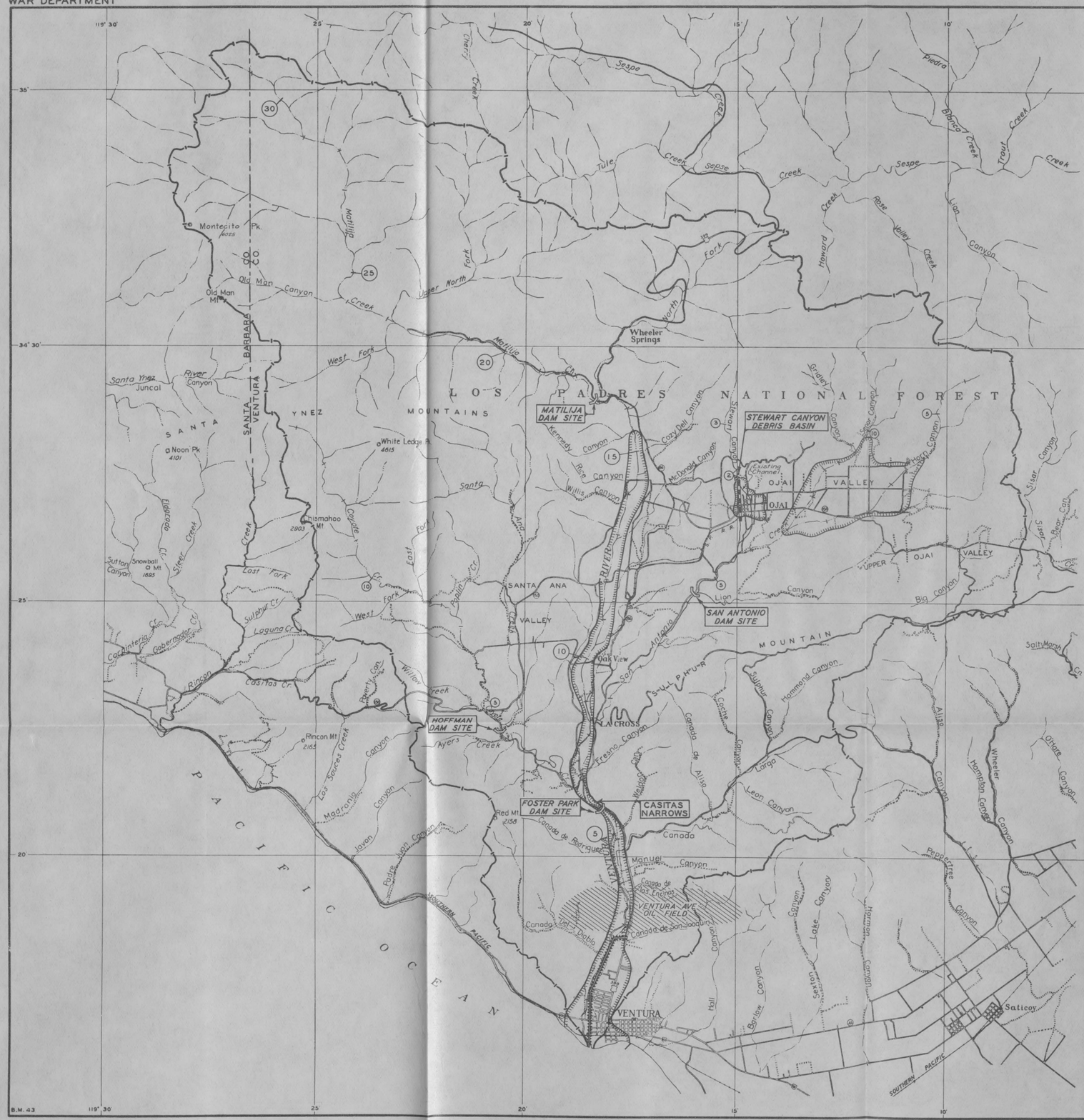
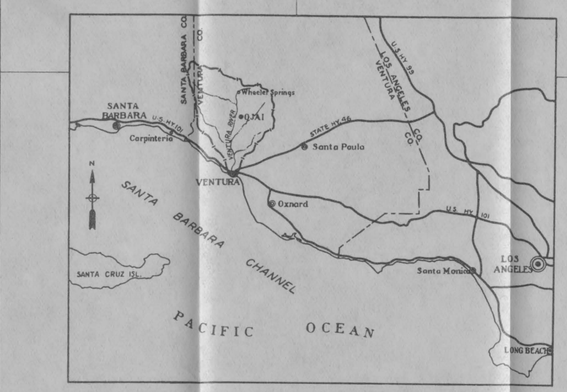
WAR DEPARTMENT

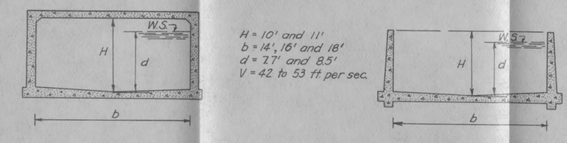
CORPS OF ENGINEERS, U.S. ARMY





VICINITY MAP

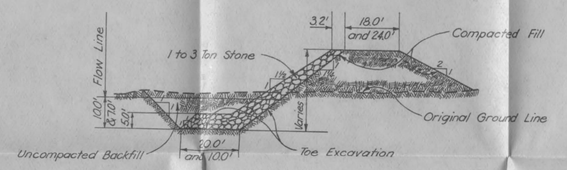
SCALE IN MILES



CLOSED CONDUIT AT STREETS

OPEN CHANNEL

TYPICAL CHANNEL SECTIONS
STEWART CANYON, OJAI



TYPICAL LEVEE SECTION
VENTURA RIVER

SCALE: 1 IN. = 40 FT.

LEGEND

- BOUNDARY OF DRAINAGE AREA
- BOUNDARY OF AREA SUBJECT TO OVERFLOW
- OIL FIELD
- RIVER MILES FROM MOUTH
- CHANNEL RECOMMENDED
- LEVEE RECOMMENDED
- DEBRIS BASIN RECOMMENDED
- DAM SITES CONSIDERED BUT NOT RECOMMENDED

—NOTE—
Traced from U.S.G.S. Quadrangle Sheets Ventura, Santa Paula and Mt. Pinos

VENTURA RIVER, CALIFORNIA, SURVEY FOR FLOOD CONTROL

VENTURA RIVER BASIN
GENERAL PLAN AND AREA SUBJECT TO OVERFLOW

SCALE 1:125,000 — IN 1 SHEET

GRAPHIC SCALE 0.5 0 1 MILES

U.S. ENGINEER OFFICE, LOS ANGELES, CALIFORNIA: SEPT. 1940

SUBMITTED BY: M. A. Matthiason, CAPTAIN, CORPS OF ENGINEERS, U.S. ARMY, CHIEF, ENGINEERING DIVISION

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ENCLOSURE 1